# STANDUP NOTEBOOK COMPUTER

## FIELD OF THE INVENTION

This invention relates to notebook computers and more specifically to a notebook computer physically configured for enhanced heat dissipation and improved ergonomics.

## DESCRIPTION OF RELATED ART

Conventional notebook computers generally employ a clamshell design in which upper and lower hinged pieces move apart to reveal an inner top surface and an inner bottom surface. The upper hinged piece usually includes a backlit liquid crystal display. The lower hinged piece usually includes all other components of the computer, such as a cpu, random access memory, a direct access storage device, a pointing device, a battery, and a keyboard disposed on the inner bottom surface.

Heat dissipation is frequently a problem with conventional notebook computers. The lower hinged piece is positioned horizontally, usually very close to a horizontal support surface. Convective airflow around the lower hinged piece is therefore very limited, so heat tends to build up within the lower hinged piece. Excessive heat can damage the components of the computer and reduce the reliability of computer operations.

Additionally, the display of a conventional notebook computer is positioned just above the hinge, so the bottom of the display is located only slightly above the lower hinged piece. This relatively low display position may be uncomfortable for many users. Further, the display typically tilts back from the hinge by three to four inches. Since the lower hinged piece is often eight and one-half inches or more in depth, the total depth of the computer including the lower hinged piece and the tilted upper hinged piece can easily exceed twelve inches. This depth can cause problems when a user attempts to operate the computer on a small seatback tray in an airplane.

Finally, the keyboard of a conventional notebook computer is attached to the top of the lower hinged piece, which is often about two inches above the horizontal support surface. This disposition of the keyboard limits user flexibility. Some users would prefer a keyboard that is closer to the horizontal support surface (e.g. a desktop, an airline seatback tray, or one's lap) and that does not rest on top of the lower hinged piece.

A notebook computer capable of operating in a configuration that enhances heat dissipation and provides better display and keyboard ergonomics is therefore needed.

## SUMMARY OF THE INVENTION

It is accordingly an object of this invention to devise a notebook computer having a main body, including many of the heat-generating computer components, standing in a substantially vertical position so that heat may radiate from both the front and back surfaces of the main body, and so that heat may dissipate more efficiently via convection.

It is a related object that the display of the notebook computer of the present invention should be pivotably attached to the main body and located above the main body in a substantially vertical orientation, such that the display is in a higher, less tilted, more ergonomically correct position than is the case with a conventional notebook computer configuration.

It is a related object that the notebook computer of the present invention should include means for supporting the main body in a substantially vertical position and for providing lateral mechanical stability. The means may include a base frame into which the main body slides via pin-and-channel mechanisms. The means may also include hinged side struts enabling the keyboard to unfold from the main body. Folding rear struts that unfold to form support members when the user removes the keyboard from the main body may also be included. The battery may also serve as a support member for the main body when pivotably unfolded from the main body.



It is a related object that the keyboard may be separated if not entirely detached from the main body of the notebook computer of the present invention for use on a horizontal support surface, such that the keyboard height is less than the keyboard height of a conventional notebook computer.

It is a related object that electrical signals may be conducted between the main body and the keyboard of the notebook computer of the present invention via a set of pins that also function to mechanically interconnect the keyboard to the notebook computer.

It is a related object that the main body may include a second display on its front surface for those situations where two displays facing the user would increase the utility of the notebook computer of the present invention. One display may be used for the Windows (R) desktop, for example, and the other may be used exclusively by a single application.

It is a related object that the notebook computer of the present invention may also operate in the normal clamshell configuration.

It is a related object that the notebook computer of the present invention be configurable from its closed state to its fully deployed state by a user's hands in one smooth motion.

The foregoing objects are believed satisfied by the notebook computer of the present invention as described below.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective drawing of the preferred embodiment of the notebook computer according to the present invention in its conventional configuration.

FIG. **2** is a perspective drawing of the main body shown separated from the base frame and keyboard of the preferred embodiment of the notebook computer according to the present invention.

FIG. **3** is an enlarged perspective drawing of the main body of the notebook computer of the preferred embodiment depicting a guide channel and a transverse guide channel portion according to the present invention.

FIG. **4** is a perspective drawing of the preferred embodiment of the notebook computer, in which the main body has translated away from the keyboard, according to the present invention.

FIG. **5** is a perspective drawing of the preferred embodiment of the notebook computer, in which the main body has begun to rotate and rise vertically, according to the present invention.

FIG. **6** is a perspective drawing of the preferred embodiment of the notebook computer in its fully deployed configuration, according to the present invention.

FIGS. **7**A through **7**D are side views of the main body during deployment of the preferred embodiment of the notebook computer relative to the sliding pins of the base frame.

FIG. **8** is a perspective drawing of the second embodiment of the notebook computer according to the present invention in its conventional configuration.